VOL. IX. No. 6.

Entomological News

ARGYNNIS PLUTO.
(Fossil butterfly)

JUNE, 1898.

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PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.
1898.

Entered at the Philadelphia Post Office as Second Class Matter.

Entomological News

published monthly, **excepting July and August**, in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

Annual subscription $1.00, in advance.
(Outside of the United States and Canada, $1.20)

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents. Cash in advance.

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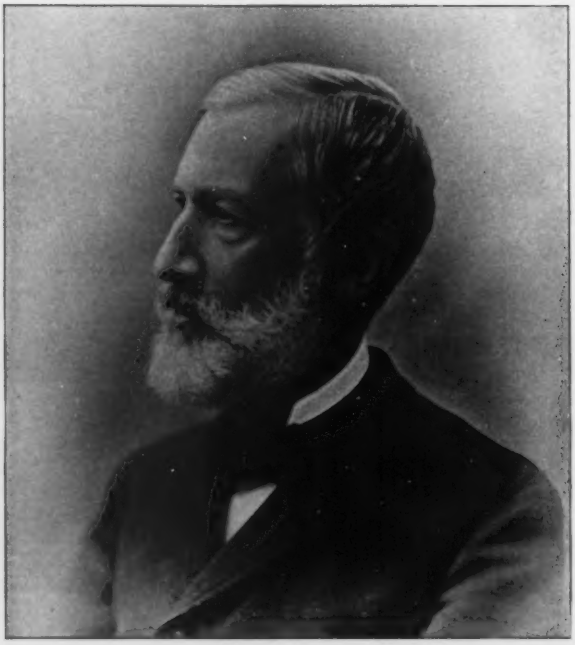

JOSEPH ALBERT LINTNER.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. IX. JUNE, 1898. No. 6.

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JOSEPH ALBERT LINTNER.

It is with sorrow and regret that we announce the death of Prof. Lintner on May 5th at Rome, Italy.

"JOSEPH ALBERT LINTNER, Ph.D., of German descent, was a son of Rev. George Ames Lintner, D.D., who was born in Minden, Montgomery County, N. Y., in 1796, was graduated from Union College in 1817, and was pastor of the Lutheran churches of Schoharie, Middleburg and Cobleskill for many years. Prof. Lintner was born in Schoharie, February 8, 1822, attended the Jefferson Academy; was graduated from the Schoharie Academy in 1837 and spent ten years in mercantile pursuits in New York city, where he also prosecuted his studies under the Mercantile Library Association. He contributed scientific articles to the Tribune and other newspapers, and returning to Schoharie in 1848, engaged in mercantile business. In 1853 he began a collection of insects, and in 1860 removed to Utica, where, for seven years, he manufactured woolen goods. Meanwhile, he had steadily pursued his scientific studies, for which he had a natural taste and unusual capacity. In 1868 he became zoological assistant in the State Museum of Natural History at Albany; in 1880 he was appointed, by Governor Cornell, State entomologist;

in 1883 he was placed on the scientific staff of the Museum, a position he held until his death. He has written about one thousand papers on scientific subjects, published twelve Annual Reports on the Injurious and other Insects of the State of New York, and was widely recognized as one of the foremost entomologists of the world His services in the interests of agriculture and allied pursuits have been of great value to both the State and Nation. He was a forceful speaker, an accomplished writer, and a man of not only high scientific, but of rare personal attainments. In 1884 the Regents of the University of the State of New York conferred upon him the honorary degree of Ph.D. He was president of the Entomological Club of the American Association for the Advancement of Science, and the Association of Economic Entomologists, two years each, has been president of the department of natural science in the Albany Institute since 1879, and was a member of the American Entomological Society, the Entomological Society of Washington, D. C., the Entomological Society of Ontario, Canada, the New York Academy of Science, the Buffalo Society of Natural Sciences, the Cambridge Entomological Club, the Academy of Natural Sciences of Davenport, Iowa, the Oneida Historical Society, the Kansas State Horticultural Society, the New York State Agricultural Society, the Musée Royal d'Histoire Naturelle de Belge, Société Imperiale des Naturalistes de Moscou, and Société Entomologique de France, and since August 21, 1873, fellow of the American Association for the Advancement of Science. For twenty-five years he was editor of the entomological department of the "Country Gentleman." October 2, 1856, he married Frances C., daughter of Hon. Holmes Hutchinson, of Utica, N. Y. Their children are George A., of Minneapolis, and Charles H. (deceased), of St. Paul, Minn., and Mary C. and Laura B., of Albany, N. Y."

YEARS ago when I collected Lepidoptera in this locality I never saw a specimen of *Pyrgus tessellata* anywhere. On coming back here this Fall the first thing that attracted my attention were specimens of *tessellata* flying along the sidewalks and in our back yard; they seemed to be quite common.—G. R. PILATE, Dayton, O.

Some Observations on the Hunting Spider, Lycosa vulpina.*

By Miss Annie B. Sargent.

(Communicated to the Naturalists' Field Club, University of Pa., Nov. 12, 1897.)

Among the hunting spiders found in the mountains of the central part of Pennsylvania, *Lycosa vulpina* is one of the largest. It excavates burrows or trenches under rocks and stones and sometimes under fallen trees. In the Spring this spider is especially conspicuous because of the large yellowish-white egg-ball which it carries suspended from its spinnerets.

The specimen about to be described was captured early in May, bearing its egg-ball. In captivity it was provided with a box resembling, as nearly as possible, the mountain home it had just left. For several days the spider roamed restlessly about trying to find a way of escape. If flies were put into the box they were devoured, but abundance of food and apparently comfortable quarters did not suffice to make her contented. After several days I was dismayed to find the spider tearing the egg-ball open. The eggs were scattered, and the restless searching for an opening continued. Whether the eggs were unfertilized and the spider's instinct impelled her to destroy the ball, or whether it was the time when she would ordinarily have freed the young spiders is difficult to say. A sense of her captivity may have come into play here in some degree. However, she continued to pry into the cracks of the lid, ever looking for a way out, for ten days more, and then something far more important began to occupy the spider's time. She dug a burrow right down through the dry grass and earth, slanting it slightly toward the sun. Whether the object was to admit the sun or not is a question, for in the wild state all the burrows I have seen are entirely away from access of sunlight. Another noticeable feature about this burrow was that it had no protection whatever above it, although there were plenty of large stones in the box. The box was covered with glass, but it seems curious that the spider should realize sufficient protection in this.

After the burrow was finished the spider went through a most interesting performance in one corner of the box. She turned

* A brief bibliography for the Lycosidæ, including some titles on habits, is given by Mr. J. H. Emerton in Proceedings of the Connecticut Academy of Arts and Sciences vol. vi, p. 482.

around in a circle as if her body was fastened to the ground by a pivot touching her spinneret down to the ground at intervals. It became evident after a few circles that she was drawing out a strand of silk and fastening it down with every touch. This process was continued until quite a mat was made, when the whole thing was taken up and carried down the burrow. What went on in the burrow I do not know, but the next morning the mouth was sealed with a film of web. About three days later, in the morning, I found the spider standing in the mouth of the burrow twirling, with the hind legs, a brand new egg-ball in the sun. After some time she went down again and before the day was done a new film was made. From this time on I saw the spider at irregular intervals. She would stay sealed up in the burrow for two days or more, then in the morning—always in the morning—the film would be rudely torn away and the spider would stand motionless holding the ball in the sun or twirling it with her hind legs. Again, she walked about the box, took a drink of water, or ate a fly before returning to the burrow. She frequently detached the ball and, holding it in her jaws, made a sort of "shirred" ridge around it. What this process was for I could not make out. She may have been making the fastenings firmer, or she may have been testing the eggs in some peculiar fashion. After about a week of these proceedings the spider went into the burrow and remained sealed up for three or four days. One morning after this she issued forth to take a drink of water with her back literally crowded with tiny white spiders. After a short time she went into the burrow with her family and, as usual, was seen no more that day; but the burrow was not sealed. She came out every day after this and caught flies in spite of her family burdens. The little spiders had no share in these meals, but seemed to thrive notwithstanding. At this stage the glass was accidentally pushed off and the spider escaped. Several days later she was recaptured, but the little ones were gone except six. These I put into pill-boxes. Each spider had a box to itself. The boxes were partly filled with earth, and all were covered with a sheet of glass. They were fed on the tiniest flies to be found, at first, and grew rapidly, casting their skins at intervals. Before each moult they stopped eating for a day or two, built a little shelter of web and earth against the side of the box, and under this the skin was cast. At no other time did they

attempt to make a nest of any kind. They never ate their skins, as many insects, and even some of the vertebrates do. Meanwhile, the mother spider made a new burrow and hatched a second brood. These were not quite so numerous, and as the Summer was nearly spent I did not save any of them. The mother began one more egg-ball after this, but when it was only partly done she gave it up and spun no more.

Of the six I had saved, three died and one escaped before they had outgrown the pill-boxes. One survivor was kept through the Winter and the next succeeding Summer, when I gave it its freedom. Having been raised in a box this spider never tried to get out, and did not seem to be aware of when the lid was off. When finally I let it go I had to poke it out of the box, and then it acted as if it were in a new country, feeling its way along through the grass then stopping to rest. Spiders that were captured in the adult state always ran very briskly when they regained their freedom.

In the matter of catching flies this spider was an acrobat, and I am sure could detect motion at a distance of at least two inches. There was one particular corner in which I always put the flies and if the spider was hungry it could see those flies coming through the hole and came up to seize them, as they came in, almost out of my fingers. I have seen it clinging to the top of the box and the instant a fly passed beneath, it dropped down right side up and caught its victim. Never once did I see this spider miss its mark. It did not spring until it was sure, but it never miscalculated. If the spider had eaten nothing for several days it would catch flies at long distances and in the most awkward positions. It would catch them in succession, too, until it held three in its jaws at the same time. If it was not very hungry it did not catch flies until they came within easy range. Sometimes, when the spider was fasting, a fly might walk over its legs and cause it to twitch them out of the way, but it would not catch the fly. One time I placed a large ichneumon-fly in the box. The spider stole up to it and barely touched it with the tip of its foot, as a cricket would feel with its antennæ, then waited; the ichneumon moved and the spider touched it again. But the spider went no nearer and would not seize the ichneumon, although it flew right against the spider. The spider evidently appreciated something not to its taste in the ichneumon and this

would go to show that the spider is guided by something more than the mere motion of a smaller creature in selecting its food. I noticed also that the older spider did not like metallic-green flies. She would not eat them unless very hungry indeed. On several occasions she dropped them uneaten, although usually they flew about the box unnoticed. That mere motion plays a large part in recognizing food, however, is evident from the fact that often when I moved my finger back and forth over the glass the spider came up to that place evidently expecting flies. That the spider followed the motion of the flies at times was also evident, for I have seen it elevate or lower its head in the direction of the fly, turn its entire body around as the fly moved, and in some cases follow it. On one occasion no flies were to be had, and finally I decided to try raw meat. As long as the meat merely lay in the box the spider would not touch it, but when I put a thread through it and swung it back and forth the spider rushed out and seized its supposed prey. The meat once in its jaws the spider deigned to eat it. After a few days, however, it refused to eat meat. I then offered it cooked meat and even bits of hash which satisfied it for a few days more, when I succeeded in obtaining some flies.

Meanwhile the mother spider was unmistakably growing old. She could not catch flies unless they were very close, and even then she frequently lost her hold of them. Her jaws seemed to have lost all their power and gradually stiffened, until finally she made no attempt to catch flies. Her legs and body came to have a shriveled, dried appearance, and she walked unsteadily, rolling from side to side. Her faculties were failing just as surely as they do in higher animals, and one morning I found her stiff to the last degree and dead.

———o———

NOTES ON AMERICAN SPHINGIDÆ.—II.

By WILLIAM SCHAUS.

The following notes are in continuation of a paper published in ENT. NEWS vol. vi, p. 141.

Theretra opaphus.

Chær. epaphus Bdv., Sp. Gen. Het. i, p. 267, 1875. [1881.
Chær. cyrene Druce, Biol. Cent.-Am., Lep. Het. i, p. 11, T. 1, f. 5,
Theretra drucei Kirby, Cat. Lep. Het. p. 658.

My attention was drawn to the above synonymy by Mons. C. Oberthür, who compared Boisduval's type with the excellent figure in the Biologia.

Theretra neoptolemus.

Sphinx neoptolemus Cr., Pap. Exot. iv, t. 301, fig. F, 1780.
Chær. trilineata Walk., Cat. Lep. Het. B. M. xxxi, p. 30, 1864.

I can see no reason for separating Walker's species from *T. neoptolemus*.

Theretra isaon.

Chær isaon Bdv., Sp. Gen. Het. i, p. 272, 1875.
Theretra olivacea Roths., Nov. Zool. i, p. 77, 1894.

My specimens of *T. isaon*, compared with type of Boisduval, agree with the description of *T. olivacea*.

Theretra pistacina.

Philampelus pistacina Bdv., Sp. Gen. Het. i, p. 199, 1875.
Chær. jocasta Druce, Ann. Nat. Hist. (6), ii, p. 237, 1888.

Of the above species I have a specimen compared with both types.

Theretra aglaor.

C. aglaor Bdv., Sp. Gen. Het. i, p. 275, 1875.
C. libya Druce, Ent. Month. Mag. xiv, p. 249, 1878.
C. lælia Druce, Ent. Month. Mag. xiv, p. 249, 1878.

C. libya is certainly the same as *C. aglaor*, and in the B. M. collection the specimen labeled as *C. lælia* by Mr. Druce is inseparable from the specimen which he has labeled as *C. libya*.

Theretra arpi sp. nov.

Head and thorax olive-brown; a white line in front of the antennæ; patagiæ laterally streaked with white; a reddish brown spot on collar, a similar spot on patagiæ and some reddish brown shades posteriorly on thorax. Abdomen olive-green above, grayish below. Primaries light gray, heavily shaded with olive-green in the disc, and otherwise covered with greenish striæ; an antemedial, geminate, dark green curved line not reaching the inner margin; a minute black point in the cell; three postmedial dark lunulate lines, followed by a row of points on the veins; an olive-green apical spot and a subterminal cluster of dark scales between 5 and 6. Secondaries dark brown; the costal margin, the apical portion of the fringe, the inner margin narrowly, and a broad subterminal shade at the anal angle, yellowish; the subterminal shade somewhat suffused with olive-green. Exp. 66 mm.

Hab.—Rio Janeiro.

Dilophonota œnotrus.

Sphinx œnotrus Cr., Pap. Ex. iv, T. 301, C. 1780. [f. 4, 1865.
♂ *Erinnyis melancholica* Grote, Proc. Ent. Soc. Phil. v, p. 77, T. ii,
♂ *Anceryx janiphæ* Bdv., Sp. Gen. Het. i, p. 131, 1875.
♀ *Erinnyis cinerosa* Grote, Ann. Lyc. N. Y. viii, p. 201, 1867.
♀ *Anceryx piperis* Bdv., Sp. Gen. Het. i, p. 132, 1875.

Much confusion has arisen from the careless identification of Cramer's figure, but the description accompanying the plate leaves no doubt as to the species represented, for attention is drawn to the color of the abdomen below, which is white with four black points on either side. In the species heretofore considered as *œnotrus*, the abdomen below is brownish gray without any spots. For this latter form I propose the name of *Dilophonota crameri;* it is well described by Boisduval in his Sphingidæ, p. 129, under the name of *Anceryx œnotrus*. *D. crameri* is found throughout tropical America and also occurs in southern Florida.

Dilophonota domingonis.

D. domingonis Butl., Proc. Zool. Soc. London, p. 258, 1875.
D. festa H. Edw., Papilio ii, p. 11, 1882.

The above names refer to the same species; it is abundant in Mexico and the sexes are more similar than is usually the case in this genus. This species has been considered a dark form of *D. obscura = rhœbus* Bdv., but I have examined over a hundred specimens of each species without finding any intermediate forms; moreover, in *D. obscura* the sexes are quite different. I find the species of *Dilophonota* very constant in their markings, *D. crameri* alone showing some variability in the color of the marginal areas of the primaries, the lines, however, remaining unaltered.

Isognathus scyron.

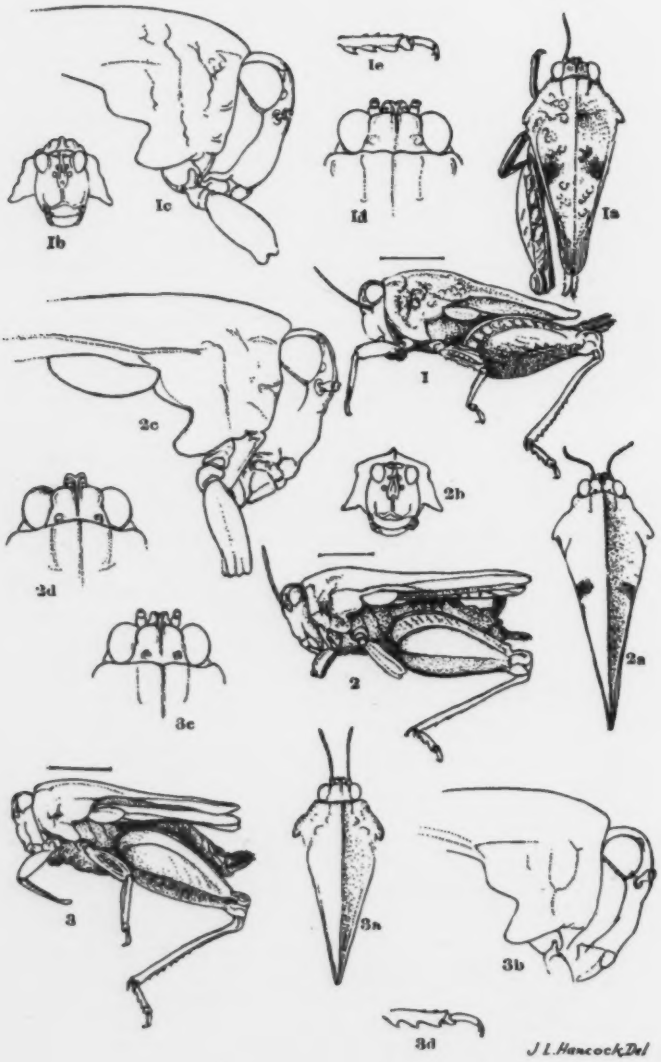
Sphinx scyron Cramer, Pap. Ex. iv, iv, t. 301, E, 1780.
Anceryx pedilanthi Boisd., Spec. Gen. Het. i, p. 124. 1875.

On examination of the type I find Boisduval's species the ♂ of *I. scyron.*

Isognathus papayæ.

Anceryx papayæ Bdv., Sp. Gen. Het. i, p. 126, 1875.
Isognathus laura Btl., Trans. Zool. Soc. London, ix, p. 601.

Papayæ type is the ♀, *laura* type, the ♂ of the same species, and both will no doubt prove to be a slight variety of *I. leachii* Swains.



TETTIGIANS OF THE GENUS NEOTETTIX (Hancock).

THE SPECIES OF THE NEW GENUS NEOTETTIX WITH A KEY TO THE GENERA OF NORTH AMERICAN TETTIGIÆ.

By J. L. HANCOCK.

(See Plate VIII.)

In the present notes are described several species of Tettigians of a hitherto unrecognized genus from the southern United States. I have, furthermore, outlined a table of the genera of Tettigiæ, including therein the new genus *Neotettix*, together with the three already known to occur within our borders. These are namely: *Nomotettix* Morse, *Neotettix* gen nov., *Paratettix* Bolivar, and *Tettix* Charpentier. The species of *Neotettix* are small in stature, in which particular they resemble *Nomotettix*. The wings are frequently abbreviated, and macropterous as well as brachypterous forms are represented among them without the apical process of the pronotum being much of it at all extended further backwards than the knee of the hind femora. These dimorphic phases of structure are not considered separately. It will be observed that Bolivar, in 1887, described a species in his Essai sur les Acridiens de la tribu des Tettigidæ p. 246, as *Tettix femoratus* Scudder. That there is a discrepancy regarding the identity of the species seems fairly certain. A specimen which was identified by Prof. Bolivar as strictly this species was previously kindly examined by Mr. Scudder, the author of the species, who informed me of a difference existing in the width of the vertex between the eyes as compared to the original *femoratus*. Partly on the strength of Mr. Scudder's assertion: "It is quite certain that the specimen you send cannot be that species from the width of the vertex between the eyes" and the knowledge gleaned from an examination of a considerable series, I have proposed the appellation *Neotettix bolivari* in deference to my distinguished colleague. The generosity of Mr. A. Bolter, of Chicago, who placed his collection of this group freely at my disposal made it possible to include two of the three species here described. One of these I take pleasure in naming in his honor. It is quite probable that the species described by Scudder as *Tettix femoratus* in "Transactions American Entomological Society" ii, p. 305, will, in the course of time, be restored, or as soon as sufficient material from Maryland, where the type came from, has been carefully studied. This species, of which the

type is lost, undoubtedly belongs to *Neotettix*, but being in doubt about its specific position in my table of species it is simply appended at the end.

Genera of Tettigiæ of North America.

Anterior femora more or less compressed, carinate above; antennæ 12–14 articles . . . . . **Tettigiæ.**

1. (4) Pronotum with the front border anteriorly angulate produced, median carina strongly cristiform, arched longitudinally, median lobule of posterior lateral lobe small; vertex in profile angulate produced . . . . . Gen. 1. **Nomotettix** Morse.
2. (3) Vertex in profile rounded anteriorly, a little advanced in front of the eyes; frontal costa strongly forked; median carina of pronotum distinctly elevated, more or less convexly curved longitudinally, not cristiform . . . Gen. 2. **Neotettix** gen. nov.
3. (2) Vertex equal to or narrower than one of the eyes, not produced in front of them, truncate anteriorly . Gen. 3. **Paratettix** Bol.
4. (1) Pronotum generally not advanced upon the head to the eyes, median lobule of posterior lateral lobe usually well developed; vertex in profile anteriorly angulate, projecting beyond the eyes. Gen. 4. **Tettix** Charp.

Neotettix gen. nov.

Frontal costa strongly forked, median lobule of posterior lateral lobe of pronotum but slightly developed; vertex in profile rounded anteriorly, from dorsal view wider than one of the eyes. Pronotum advanced upon the head to the eyes, median carina elevated, more or less arched longitudinally, dorsal front margin truncate, or scarcely angulate, dorsum transversely tectiform or convexed; hind femora broad, rather stout. Species small, with antennæ consisting of 12–13 articles. Type, *Tettix femoratus* Bolivar (not *Tettix femoratus* Scudder).

Members of this genus recall brachypterous forms of *Paratettix*, to which they seem to have a closer affinity than to either the *Nomotettix* or *Tettix* series. The crown of the head is posteriorly mammillate. Representatives can be distinguished from *Paratettix* by the character of the vertex, which is wider than one of the eyes and is not truncate anteriorly. The *Tettix* group has one or two additional antennal joints, the pronotum is not advanced upon the head to the eyes, while the species comprising the *Nomotettix* group have the pronotum distinctly cristiform, besides the vertex in profile appears angulate anteriorly. Not the least important distinction is the sudden widening of the

frontal costa in *Neotettix*, which, with the other characters we have shown, will separate, with little difficulty, its members from any of the others named.

Key to Species of Neotettix.

1. (2) Vertex in dorsal view with front border rounded, a little wider than one of the eyes . . . Sp. 1. **N. rotundafrons** sp. n.
2. (1) Vertex in dorsal view with the front border slightly convexed, much wider than one of the eyes.
3. (4) Pronotum strongly rugose, scabrous; frontal costa scarcely protuberant . . . . . Sp. 2. **N. bolteri** sp. n.
4. (3) Pronotum granulate or arenose; frontal costa rather strongly protuberant . . . . . Sp. 3. **N. bolivari** nov. nom.

Position? Sp. 4. **N. femoratus** Scud.

1. **N. rotundafrons** sp. nov. (Figs. 3, 3a, 3b, 3c, 3d, Pl. VIII).—Slightly smaller than *bolivari*. Body granulate, or to a certain extent very little rugose; vertex not as broad as in *bolivari*, barely wider than one of the eyes, the front border rounded, crown inconspicuously mammillate posteriorly; frontal costa not so roundly protuberant, branches of fork about as widely separated; pronotum truncate in front, posterior process terminating acutely, reaching to or slightly overreaching apex of femora when considering dimorphic forms together; median carina toward the front slightly arched longitudinally, distinctly elevated; dorsulum transversely tectiform, not broad between the shoulders, humeral angles obtuse or sub-straight, lateral carina slightly present. Wings shortened, not quite reaching to, or passing a little beyond the apex of process. Elytra oval, rounded apically; second femur with margins somewhat undate, posterior femora broad, rather stout. Length entire 9 mm.; pronotum 7.5–8 mm.; post-femora 5.5 mm.

Described from two females. Locality Jacksonville, Florida (Bolter). In one specimen the body is reticulated with fuscous, contrasting with yellowish white; dimorphism occurs in the wing-lengths. This species probably nearest resembles *T. femoratus* Scud.

2. **N. bolivari** nov. nom. (Figs. 2, 2a, 2b, 2c, 2d, Pl. VIII).—Body granulate; vertex much broader than one of the eyes, crown mammillate on each side posteriorly, front border slightly convex, rounding abruptly into sides, mid-carina disappearing posteriorly on the crown a little beyond the middle, in profile rounded, advanced but little in front of the eyes, continued unbroken with the frontal costa; frontal costa produced, seen n front strongly forked; pronotum truncate or scarcely angulate anteriorly, advanced upon the head to the eyes, apical process acute, extended backwards to posterior knee, dorsum rather sharply tectiform, median carina distinctly raised, slightly arched longitudinally, humeral angles

obtuse. Elytra elongate. Wings slightly overreaching apex of process in macropterous examples, or sometimes but slightly developed in brachypterous forms. Length entire: ♀ 9–10 mm.; pronotum 7.5–8.5 mm.; post-femora 5.5–6 mm. ♂ 8 mm.; pronotum 7 mm.; post-femora 5 mm.

Locality Opelousas, La., Tifton, Ga., North Carolina (Bolivar). *T. femoratus* Scud., Bolivar Annales de la Soc. Entom. de Belgique, tome xxxi, p. 264, where an excellent description can be found.

Described from seventeen specimens in author's collection (procured by G. R. Pilate).

3. **N. bolteri** sp. nov. (Figs. 1, 1a, 1b, 1c, 1d, 1e, Pl. VIII).—Body small, rather stout, strongly rugose, scabrous; vertex much broader than one of the eyes, front broader, very slightly convex, mid-carina becoming obsolete posteriorly opposite middle of eyes, in profile very little produced in front of the eyes, sub-rotundate, occiput rather protuberant above, mammillate, frontal costa not sinuate, considerably forked; pronotum truncate anteriorly, process not reaching backwards as far as apex of posterior femora, obtuse at end, median carina of pronotum elevated, arched longitudinally, higher between the shoulders, dorsum transversely convex between the shoulders, strongly rugose, with conspicuous excrescences showing in transverse section or viewed in front, antehumeral carinæ appearing very slightly, anterior lateral carinæ in front short, slightly compressed. Elytra elongate, apex sub-acutely rounded. Wings undeveloped; middle femora with a row of minute swellings between the middle carinæ, margins not undate, posterior femora broad cristate, rather short, with external pagina provided with strong diagonal rugose ridges between the middle carinæ, between the superior margin and carinæ with a curved row of sub-rounded rugose excrescences. Length entire: ♀ 9 mm.; pronotum 7.8 mm.; post-femora 5.5 mm.

Locality Jacksonville, Fla. (Bolter). Described from one specimen.

4. **N. femoratus** Scud.—Vertex but little broader than one of the eyes, barely projecting in advance of them; the front scarcely rounded; pronotum reaching to the tip of the abdomen not including the ovipositor; median carina very prominent, slightly arched; surface arenose. Elytra small, well rounded, with shallow punctures. Wings not longer than the elytra; hind femora very broad and stout. Length 9.5 mm.; pronotum 8 mm.; post-femora 5.2 mm.; elytra 1.6 mm.

Locality Maryland.

T. femoratus Scud.—Trans. Am. Ent. Soc. ii, p. 305.

T. femorata Scud.—Thomas, Synopsis Acrid. of N. Am. 1873, in Rep't U. S. Geol. Survey, p. 185.

The type was formerly in the collection of the American Entomological Society but was lost, and the species has not since been recovered, so I am told by Mr. Scudder.

EXPLANATION OF PLATE VIII.

Fig. 1. *Neotettix bolteri* Hanc.
" 1a. Same, dorsal view.
" 1b. Same, front view head and pronotum.
Fig. 1c. Enlarged greatly.
" 1d. Head, dorsal view.
" 1e. Posterior tarsus.
" 2. *Neotettix bolivari* Hanc.
" 2a. Same, dorsal view.
Fig. 2b. Same, front view.
" 2c. Enlarged greatly.
" 2d. Head, dorsal view. [Hanc.
" 3. *Neotettix rotundafrons*
" 3a. Same, dorsal view.
" 3b. Greatly enlarged.
" 3c. Head, dorsal view.
" 3d. Posterior tarsus.

CONCERNING THE NAMES OF SOME COMMON SPIDERS.

By NATHAN BANKS.

The replacement of modern and familiar specific names by those of an earlier period is one result of the application of the law of priority. Naturalists will doubtless always differ as to how closely this law shall be followed; whether in letter or in spirit. But the few cases to which I shall call attention do not, I think, require any defense. The works of De Geer and the papers of Lucas have always been accepted as of proper authority.

Lucas, in a paper entitled " Description d'une especе nouvelle d'arachnide appartenent au genre Argyope de M. Savigny," published in the Ann. Soc. Entom. France, 1833, pp. 86–88, describes *Argyope aurantia* from the vicinity of Philadelphia. The description is sufficient to recognize our common species described by Hentz as *Epeira riparia;* and the excellent figure on plate v fully confirms this determination. Walckenær and Koch have both described this species subsequent to Lucas, so that the synonymy of this species will be:

Argiope aurantia Lucas.
Epeira cophinaria Walck.
Epeira ambitoria Walck.
Nephila vestita Koch.
Epeira riparia Hentz.

Lucas, again in 1833, in a paper entitled " Sur plusieurs Arachnides nouvelles appartenent au genre Atte de M. de Walckenær,"

also published in the Ann. Soc. Entom. France, 1833, pp. 476–482, described a *Salticus variegatus* from New Orleans. The description and figure evidently apply to *Phidippus otiosus* Htz, well known from the Southern States. Koch, in Die Arachniden, placed the species in *Phidippus*, and gave a better figure. This species will then be:

Phidippus variegatus [Lucas].
Salticus variegatus Lucas.
Phidippus variegatus Koch.
Attus otiosus Hentz.

De Geer, in the seventh volume of his "Memoires pour servir a l'Histoire des Insectes," published in 1778, described several spiders from Pennsylvania.

Aranea mammeata De Geer, p. 318, pl. 39, fig. 5, is very plainly *Argiope argentata* Fab., which latter name has the priority. It could hardly have come from Pennsylvania, but is known from the extreme southern parts of our country.

Aranea rufa De Geer, p. 319, pl. 39, fig. 6, is evidently a *Dolomedes*, and I think, without doubt, *D. albineus* of Hentz. Koch described it as *Ocyale rufæ* from Pennsylvania and Georgia. So this spider will stand as:

Dolomedes rufa [De Geer].
Aranea rufa Koch.
Ocyale rufa Koch.
Dolomedes albineus Hentz.

Aranea undata De Geer, p. 320, pl. 39, fig. 8, is our common *Marptusa familiaris* Hentz. It was described three times by Koch under the genus *Marpissa;* by Blackwall as a *Salticus*, and probably by Walckenær. This species must now be:

Marptusa undata [De Geer].
Aranea undata De Geer.
Marpissa undata Koch.
Marpissa conspersa Koch.
Marpissa varia Koch.
Attus familiaris Hentz.
Salticus sundevalli Blackwall.

Koch, in vol. xiv, p. 78, of Die Arachniden, published in 1848, described *Mævia tibialis* from Pennsylvania. This is plainly the *Admestina wheeleri* of Peckham, and should be known as:

Admestina tibialis [Koch].
Mævia tibialis Koch.
Admestina wheeleri Peck.

Some Rare Butterflies for Northwest Missouri.

By FRANK J. HALL, Kansas City, Mo.

The student of geographical distribution as well as the mere collector is always interested to hear of the rare species of a given locality. To know that it is always possible to run down a new species for one's own locality gives an increased interest in careful collecting. I don't believe that this city has been noted for careful naturalists, but we have a wonderfully rich insect fauna here and a handful of eager boys trying to land it in their cabinets. We consider the following species of butterflies among the rarities and invite any body to add to the number.

Callidryas argante.—During September, 1895, the orange-colored male of this species was taken from thistle blossom in company with *eubule*, which was exceedingly common that year; the condition of the specimen was excellent. The next year, on September 20th, I took a female specimen of the same species and at the same place; the specimen was a dirty white with darker shades along the middle of both wings, and was not in so good condition as the male. During this season (1897) no specimens of *eubule* were seen.

Terias mexicana.—On the 3d of September, 1894, a single male specimen was taken on a street in this city. The specimen was somewhat frayed. No more examples were seen until this year (1897), when a specimen was taken on the blossom of the golden-rod. It was a female, and was in poor condition. The species may be instantly recognized by the sharp anal angle, which gives to the species a tailed appearance; unique among our yellow butterflies.

Eresia texana.—On Oct. 24, 1897, I took from the blossom of *Aster* a perfect female specimen of this species. Not a blemish exists, so far as can be seen, hence I am persuaded that the specimen emerged in this locality. For the benefit of the tyro I may say that the species looks very much like *Phyciodes* at first sight, but is darker and has a curved excavation on the outer margin of the fore-wings, and is ornamented with pure white, rectangular spots; on the hind wings occurring in a row of six, quite square and close together, forming a band across the center of the wing.

Phyciodes carlota.—Three specimens of the species have been taken here. The first specimen taken May 10, 1896, in a meadow and was alone; the last two were taken in company with *nycteis* from the blossom of cone-flower in September, 1897. Condition of the September specimens very good.

A SPECIES OF ORTHOPTERA.

[Plate IX represents a species of Orthoptera captured in Philadelphia. We have received the following information in regard to it:]

To the NEWS:—At your request I furnish you with all the information that I possess concerning the capture of the large mantis figured in this number of the NEWS. The specimen was captured on the 16th of last October at Mt. Airy, Philadelphia, by my neighbor, Mr. Joseph Hindermyer, who found the insect resting on the upper part of one of his tomato vines. Mr. H., not being familiar with the insect's harmless nature, was afraid to touch it, but at last managed to secure it in a paste-board box, in which condition it was brought to me. I found on dissecting the abdomen of the insect that it was a female. The eggs, which were oblong and of a whitish color, were contained in a glutinous mass, from which it was hard to separate them.

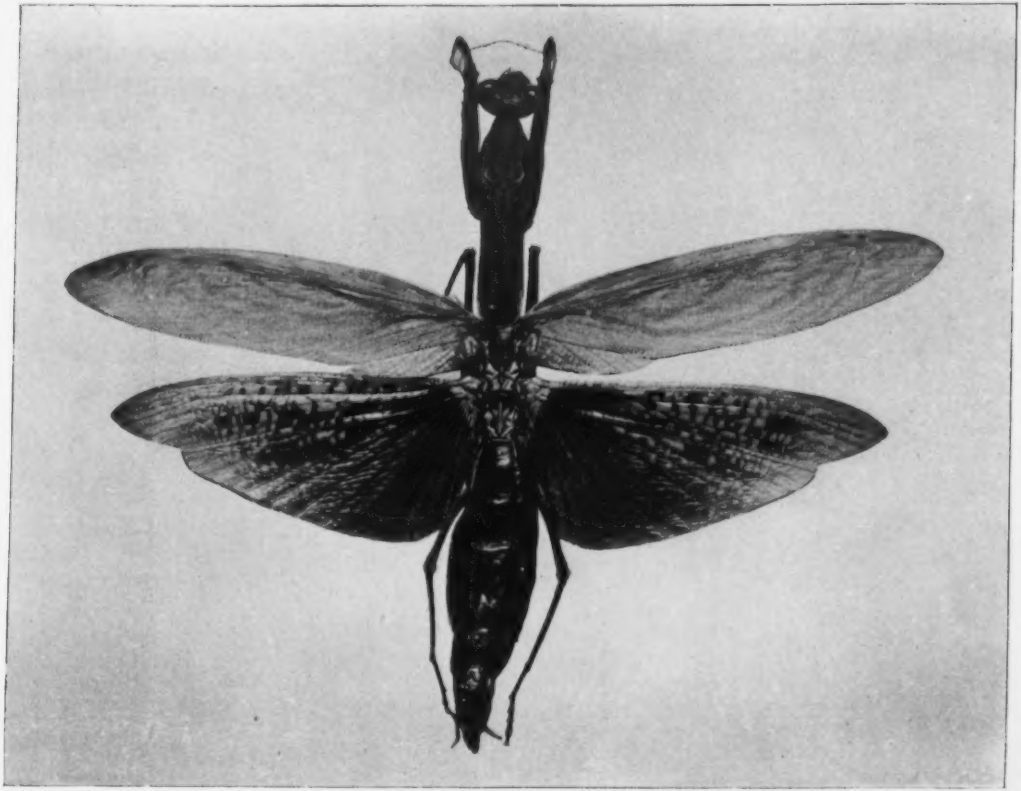
Although a careful search was made in the vicinity in which the specimen was found, no others were discovered.

Learning later that the native habitat of the insect was China and Japan, I made inquiry among those having nurseries and conservatories in the neighborhood where the specimen was captured, regarding the importation of plants from the above-named countries. At the nursery of Thomas Meehan & Sons—the largest nursery in the vicinity of where the insect was captured—I was informed that they were constantly receiving plants from all parts of the world, so that it is more than likely that the insect was introduced through this channel.

PHILIP LAURENT.

"I have examined your fine photographs of *Hierodulida*. There is no doubt that it is the *Tenodera sinensis* Saussure, from China and Japan.

"It is certainly very interesting that this large species has been transported to the United States. I suppose the bag of eggs has come over pasted on the leaves or on the branches of a Japanese plant. It is curious that it has supported the change of climate, for the *Tenodera* are only from the hot countries. It is, though, a question if the species will stand your winters. I suppose there must be many other specimens living in the neighborhood of the



TENODERA SINENSIS (Saussure).

place where your specimen has been captured. One ought to let them live, to see if they will multiply. It is a useful insect, destroying the bed plant-insects and not at all noxious to vegetation.

"The same sort of transport was effected from North Australia to the hot-houses of Kew, England. The *Cylindrodes*, sort of *Gryllotalpa*, was found in those hot-houses making great ravages in the large herbaceous plants in which it makes canals and holes.

"I received also from Java our *Gryllotalpa vulgaris*, certainly transported to Java in the earth of some pots of plants.

"In the Hymenoptera those transports are frequent only by the ships, *e. g.*, in 1854 our large *Vespa crabro* was caught for the first time in North America, and now several of our wasps have invaded the United States; they were not known at the time of Say who first gave a good account of the United States Hymenoptera.

"I shall have your photographs placed in our museum with a notice explaining what they are.

"If you occupy yourself with Orthoptera I should be indebted to you if you could send me a numerous set of the small Gryllidæ called *Tridactylus* or *Xya*, of which I could not well make out the American species."

Dr. H. de SAUSSURE.

———o———

A NEW SCALE-INSECT OF THE GENUS LECANIUM.

By T. D. A. COCKERELL, Mesilla, N. Mex.

Lecanium magnoliarum n. sp. ♀.—Scale, 8 mm. long, 4½ wide, 2½ high, elongate-oval, dark brown, the subdorsal area irregularly marked with black or blackish; dorsum bluntly keeled; surface granular, little shiny, with low wart-like protuberances at intervals, reminding one of the skin of certain slugs of the genus *Veronicella;* marginal area obscurely radiate by darker lines, but not plicate. Removed from the twig the scale leaves a white oval mark, the secretion abundant in the middle, and forming a very distinct outline where the margin of the scale was, but not indicating the place of the stigmatal incisions; ♀ antennæ 8-jointed, long and slender. Formula 3 (451) (28) 67; 4 about ¾ length of 3, 2 hardly over half as long as 3, 6 very much shorter than 5, 2 with a pair of long bristles near the end, 5 with a long bristle not far from the end, 8 with several bristles; another example has 4 not over ⅔ length of 3, 8 short, decidedly shorter than 2, 5 not quite so long as 4; formula 3 (41) 52 (86) 7. Legs long and unusually slender, coxæ and trochanter each with a bristle

near the end, coxæ a little longer than trochanter; tibia at least as long as femur, tarsus about three-fifths length of tibia; claw small; tarsal digitules short, not extending as far as those of claw; claw digitules filiform, but with tolerably large knobs. Dermis chitinous, with scattered round gland-spots, which are most numerous and largest near the margin; anal plates of the same color as the dermis, not darkened; marginal spines small and entire; a short distance from the margin are numerous small tubular glands; newly hatched larva very pale yellowish, with a slightly translucent dorsal line, appearing dark when the insect is on a dark ground; no true markings.

Hab.—Numerous on bark of twigs of deciduous *magnolia* in Japanese nursery at San José, Cal., June 12, 1897 (E. M. Ehrhorn). Presumably introduced from Japan. It is a species of *Eulecanium;* from *armeniacum* it differs in the young as well as the adult; the scale is something like *berberidis*, but the antennæ, and especially the legs, are quite different; it is also rather like *genistæ*, but differs in the antennæ. The species has been alluded to in "California Fruit Grower," July 3, 1897, p. 5.

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COLLECTING IN THE TIERRA CALIENTE.

By O. W. Barrett.

All Mexico is divided into two parts: open barren upland, hot and damp lowland. An imaginary line may be drawn along the Atlantic slope of Central America from north to south and 500 feet above that line is temperate, while 500 feet below is tropical climate. The mesa is not a desert, neither is the tierra caliente a jungle in toto, but they are vastly different regions.

The aspect is more varied in the low country—reedy, swampy areas alterating with primeval forest and chaparral wastes. From May to October the rivers rise and transform the broad grassy plains along their banks into shallow lakes: and the forests become dark, steaming hot-houses. During the Winter months, or dry season, a part of the flora dries up and Nature rests as much as she can.

Can the collector work during the rainy season? By spreading his specimens in the sun every day or two and wrapping the boxes in oil-cloth at night with plenty of naphthaline he can save a good per cent. of the collected material; yet mildew and the accursed ants will get in somehow. Where storage is such a

momentous question in remote regions the tendency is to pack too closely, which favors decay among the larger specimens.

What of the "hosts of insects?" I have traveled for hours up and down the rivers and walked for miles through the forests without seeing more than a very few insects (except the ubiquitous mosquitoes, of course). Along the larger rivers there is a small (?) insect fauna. In the depths of the forest where it is so dark that bats may often be seen flying at noon—collecting is naturally dull. But let the insect-hunter find some dark dell with a deep malarious pool and plenty of flowering shrubs about and he feels more enthusiastic, especially if there is twenty grains of quinine in him; there he may find game. Also, there game may find *him;* numerous species of ants give him samples of various solutions of formic acid; vipers and tree-snakes may give him an opportunity to test his latest snake-poison antidote; seven beautiful species of mosquitoes keep him busy; the tabano [*Tabanus* sp. ?] bites hard; the various chaquistas bore deep; the rotodor makes an itching blood-blister; ticks stick to the death; the garapato begins to dig her den (under the nails): and the moya-cuil (human Oestrid) lays the larvæ which at once proceed to establish themselves in his flesh for at least two weeks as "howling reminders" that "There's a purpose in pain, else it were hellish."

The collector cannot begin work to good advantage before ten o'clock A. M. In the forest the atmosphere is usually very sultry during the middle and latter part of the day. About two o'clock in the morning the air gets cooler; then the stridulation of the Orthoptera becomes less violently obstreperous and, toward sunrise, ceases altogether. Exposure to direct sunlight is said to be very dangerous during the Summer months; not sunstroke, but various forms of malarial fever being the result. The temperature rarely gets above 100° F.; but it is the humidity that tells on the active collector. Rainy days are rare. Two or three inches of rain may fall in as many hours. In the densest forest where the sun never shines (because of the numerous leafy "behucos" which interlace the tree-tops) the collector may continue his search for Hemiptera or Formicidæ while the rain roars harmlessly above him. The air retains a marked hydrogenous odor for several hours after a heavy rain; the humidity penetrates

all boxes and un-paraffined corks, and thus mold is sure to grow wherever there is "dead" air. Indeed, I doubt whether tin-cases could be used with any success for the storage of specimens. Leather leggings give protection from palm-thorns and snake-teeth, but when a few ants crawl beneath them—well, they must come off at once. It is almost impossicle to cross a moving army of ants without suffering thereby.

Water is usually all right if it runs. Fruits are dangerous unless well cooked. An intolerable itching beginning at the ankles and spreading over the body lasts for a few weeks after entering "la tierra caliente;" unless the condition of the blood is very good it amounts to much more than a "heat rash." Bilious, intestinal, and malarial diseases are the most common. The dangers from poisonous plants and insects, "tigres" and "Indios" may be overestimated, but the collector would be foolhardy to go about without his revolver.

Although the country has many faults there are many things about it to gladden the heart of the would-be entomologist. There the brilliant *Morpho peleides* flits about the tree-tops, the *Ithomias* hover on gaudy wings in the sunshiny vistas, and perchance a royal *Caligo* floats across the forest path and folds its purple vesture upon the trunk of some rough-barked tree before the very eyes of the collector—safe in its mimicry. Huge flies, mighty Cerambycidæ; beautiful Odonata, like the lazy *Megaloprepus cærulescens*, and ferocious Hymenoptera; they are there, and it is a wonderful thing to live there with them and get acquainted with them all. It is truly a great thing to live in the tierra caliente, in the "rich faunal region" where one can see the species actually alive and in their proper environment, fresh and [occasionally] entire and "at their best." However, it is a great thing to see the same specimens (*i. e.*, the perfect ones) arranged over the white paper of a cabinet; to have a bed to sleep upon and something to eat; to live without fever and within reach of a physician.

Idealization is an excellent thing in its place—in magazine articles, for example; but it wilts in the desert places and cannot thrive in a tropical forest.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for certain issue. Twenty-five "extras" without change in form will be given free when they are wanted, and this should be so stated on the MS. along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1898.

PACKING OF INSECTS.

We think that it will be necessary to publish in the NEWS an article on packing insects for shipment by mail or express for the benefit of professors of entomology, experiment station entomologists, beginners and others. We receive many packages of insects here and have a good opportunity of finding out how little some of our good friends know about the subject. Occasionally a box arrives by mail without any covering or packing whatever, and then we fasten a handle to it and give it to the baby for a rattle The sender in this case certainly has faith. Next comes a box with packing on two sides. The fellow that sends this kind reminds us of the ostrich who sticks his head in the sand and thinks he can't be seen. Another variety is the kind with sufficient space between the outer and inner box, but the packing has evidently been hammered in with mallet and chisel. The fellow that sends this kind is evidently not a physicist. The commonest mistake of all is to have much waste space in the inner box. Don't send a few specimens in a box that will hold fifty, as the smaller the box, as a rule, the greater its safety. There are really few people in America that understand the fine art of properly packing insects for shipment. We will publish an article on this subject in a subsequent issue.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A REPLY to Mr. W. R. Howard's query.—The length of the egg-stage of *T. luna* and other moths. In looking over my notes of life-histories I find the following, which may interest some of your readers:

	Length of egg-stage.
promethea	12 days.
luna	12 "
polyphemus	12 "
cecropia	13 "
imperialis	13 "
regalis	16 "
rubicunda	13 "
stigma	15 "
A. torrefacta	13 "
A. bigutlata	6 "
A. drexellii	8 "
N. gibbosa	6 "
A. virgo.	12 "
A. nais	11 "

	1st brood	2d brood	
S. excæcatus	8	10 days.	
S. astylus	11	8 "	
S. myops	15	"	
D. hylæus	8	"	

	1st brood	2d brood	3d brood
E. myron	7	9	6 days.
T. abbottii	6		"
H. affinis	7		"
E. harrisii	11		"
D. lineata	6		"
S. kalmiæ	36		"
D. undulosa	8		"
C. amyntor	6		"
C. juglandis	8	7	"

Different broods have varied. I also find that Miss Eliot and I have found *luna* on white birch more than on any other tree.

Mr. Howard will find that larvæ need no "trees" at all. If he will keep them in tightly closed tin boxes, with twigs and leaves, they will thrive well. I have described this process fully in an article written for teachers and published in "Primary Education" for March, 1898. In Massachusetts I think *asterias* chrysalids would be dear at five cents. In New Hampshire and Vermont I am sure they would.—CAROLINE G. SOULE, Brookline, Mass.

FOURTH INTERNATIONAL CONGRESS OF ZOOLOGY.—The Reception Committee has issued a circular containing particulars with regard to lodgings and other accommodation at Cambridge during the meeting in August next, and giving other information as to the railway fares from various parts of the Continent, and other arrangements for the Congress.

The circular is accompanied by a reply-form, to be filled up and returned to the Secretaries by any member of the Congress who wishes rooms to be taken for him.

These circulars have been sent to all who have already informed the Reception Committee that they hope to be present at the meeting, and will be sent to other Zoologists who apply to the Secretaries of the Reception Committee, The Museums, Cambridge, England.

A BEETLE REMOVED FROM A LADY'S EAR.—May 19, 1897, Dr. A. S. Daggett, of Pittsburg, Pa., removed from the external ear of a German lady a beetle nearly one-half an inch long; it was in the auditory canal, close to the drum, and it was enclosed in a dense plug of wax. The drum was ulcerated, with considerable surrounding congestion. The lady did not know that she had an insect in her ear. The specimen, which was referred to me, was a mere shell, the soft parts having been dissolved; it was, however, perfectly recognizable, and it agreed with the European species *Phyllopertha horticola* Linn. (Scarabæidæ). The determination was made by direct comparison of specimens from Switzerland. The species, so far as I know, does not occur in this country. The lady has not been in Europe since August, 1893, consequently this large beetle must have been in her ear at least three years and nine months; perhaps much longer.—HERBERT H. SMITH.

INTERESTING CAPTURES.—The morning of Feb. 10, 1898, I found here, near the bed of a small mountain stream, in a grassy, damp situation on the lower surface of a stone a specimen of the curious blind Tenebrionid *Alaudes singularis* Horn. The beetle was in the society of a small black ant with black abdomen and reddish brown thorax and head. The ants and the *Alaudes* were absolutely motionless, benumbed by the rather cold morning air, and it was only after some minutes of scrupulous searching that I discovered the minute beetle adhering to the lower surface of the stone. It feigned death even in the cyanide bottle quite a long time for his small size. Under the same stone was a specimen of *Anchomma costatum* Lec.

During the month of January I have taken on the banks of the above-described streamlet on meat hidden by me under stones, chips and leaves about two dozens of *Cychrus mimus* Horn. More than the half of the specimens were females.—A. FENYES, M.D., Pasadena, Cal.

NOTES ON NEOMINOIS RIDINGSII AND DIONYSIUS.—*Dionysius* exists at just the same altitude as *ridingsii*, so the differences are not the effect of altitude. *Ridingsii* is very abundant everywhere around the city of Denver; even in the city in grassy places. This elevation is from five to six thousand feet; it also occurs up to eight thousand feet, and probably higher.

Glenwood Springs, Garfield County, Colorado, where *dionysius* is abundant is just the same elevation as Denver with this difference: Denver is a gradual elevation of the plains, while Glenwood is a depression in the mountains worn by the rapid rivers. *Ridingsii* is found in the short grass, *dionysius* on sandy and stony desert tracts, always sitting on the hot sand of the trails, and, when started, flying on the bare rocks either down to the riverside or the side of the cliffs above for a few minutes, then back to the hot dusty tracts. Both species occur at Salida, their habits and habitat still keeping distinct. This place is over seven thousand feet in altitude. Here I have taken *dionysius* in a volcanic patch, barren and desolate, and *ridingsii* on the grassy meadow watered by the little Arkansas River.—DAVID BRUCE.

"INSECT GRAFTING.—A discovery which may lead to important results has been made by Mr. Henry E. Crampton, Instructor in Biology in Columbia University. Mr. Crampton has been studying the works of a German scientist named Born, and has made a practical test of some of his theories, with extraordinary results. He has experimented on the embryo of the butterfly at the period of its existence when it lies inactive in its cocoon, after its life as a caterpillar. Every one has seen the grub spinning its delicate nest on a leaf or twig, and entering it, as into a grave, remaining there eating nothing and apparently dead for a few weeks, and then emerging from it a beautiful creature with wings. Mr. Crampton collected a number of these cocoons and operated on their insensible occupants. He found that he could cut the comatose creatures in half and join the half of one to the half of another without affecting the life of either. The chrysalids so joined accomplished the usual period of their retirement and emerged from it as two butterflies, with wonderful combinations of colors and organisms, apparently none the worse for the operation which had been performed. Prof. Smith, of the New Jersey Experiment Station, who has made the facts of Mr. Crampton's work known, believes that the discovery will constitute an era in biological science. The principle has an endless variety in possible forms of application and may eventually reach to higher orders of life. The possibility of continuing two natures in a single living organism being once demonstrated, scientists will perceive how far-reaching may be the effects of such experiments."—*Christian Herald.*

Entomological Literature.

Under the above head it is intended to note such papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South). Articles irrelevant to American entomology, unless monographs, or containing descriptions of new genera, will not be noted. Contributions to the anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **heavy-faced type** refer to the journals, as numbered in the following list, in which the papers are published; * denotes that the paper in question contains descriptions of new North American forms. Titles of all articles in foreign languages are translated into English; usually such articles are written in the same language as the title of the journal containing them, but when such articles are in other languages than English, French, German or Italian, this fact is indicated in parenthesis.

4. The Canadian Entomologist, London, Ont., May, '98.—**5.** Psyche, Cambridge, Mass., May, '98.—**8.** The Entomologist's Monthly Magazine, London, May, '98.—**9.** The Entomologist, London, May, '98.—**14.** Pro-

ceedings of the Zoological Society of London, '97, part iv, April 1. '98.—**21.** The Entomologist's Record, London, April 15, '98.—**22.** Zoologischer Anzeiger, Leipsic, April 4, '98.—**36.** Transactions, Entomological Society of London, '98, pt. i, April 20.—**41.** Entomologische Nachrichten, xxiv, 5, Berlin, March, '98.—**64.** Annalen d. K. K. Naturhistorischen Hofmuseums, xii, Vienna, '97.—**72.** Transactions, Kansas Academy of Science xv, Topeka, '98.—**73.** Archives de Zoologie Experimentale et Generale (3), v, 3, Paris, '97.—**74.** Naturwissenschaftliche Wochenschrift, Berlin, April 24, '98.—**75.** Twenty-eighth Annual Report, Entomological Society of Ontario, Toronto, '98.

The General Subject.—A TEXT-BOOK OF ENTOMOLOGY including the Anatomy, Physiology, Embryology and Metamorphoses of Insects for use in Agricultural and Technical Schools and Colleges as well as by the working Entomologist. By Alpheus S. Packard, M.D., Ph.D, Professor of Zoölogy and Geology, Brown University, Author of "Guide to Study of Insects," "Entomology for Beginners," etc. New York. The Macmillan Company, 1898. 8vo, pp. xvii, 729; 654 figs. Received from the publishers through John Wanamaker. Price $4.50.

For some years past we have been expecting a new edition of Prof. Packard's "Guide," but the present work is something entirely different. Nothing like it, in its scope, has appeared in English since Newport's article on Insecta in 1839, while in other languages the only comparable works, during the same period, have been Graber's "Insecten," 1877, and Kolbe's "Einführung," 1893. No one or two men could, out of their own experience, produce such a work, so that we are here given a summary of the labors of several generations of anatomists, physiologists and embryologists upon insects, and treated from the standpoint of morphology, of comparative anatomy and physiology. The first part, entitled "Morphology and Physiology," deals with the position of Insects in the Animal Kingdom (pp. 1–26), the External (pp. 27–210) and the Internal (pp. 211–514) Anatomy. The Second Part, on Embryology (pp. 515–592), is stated to be based on Korschelt and Heider's Lehrbuch. The Third Part (pp. 593–708) treats of the Metamorphoses. At the end of each section dealing with some special structure or function, following the model set by the German text-books, a bibliography is given with this improvement —that the entries are arranged chronologically. Needless to say these add immensely to the value of the book. The illustrations, whose wealth is indicated above, show signs of the improvement gradually appearing in English text-books, relieving them of the charge of inferiority compared with those in German. Being, from the nature of the case, chiefly a summary and a compilation, the value of the work must depend on the thoroughness with which this has been done. Few are in a position to judge of the degree of this thoroughness in the various groups, and we cannot therefore express an opinion on this point. Specialists will perhaps detect some omissions as, for example, any reference *in the text* to Ris' researches on the proventriculus of Odonata, or the statement, re-

produced from Wheeler (p. 355), that the embryonic number of Malpighian tubules in Ephemeridea and Odonata has not been ascertained. In the latter group the number is three, as first stated in the NEWS for June, 1895, p. 181, and subsequently expressly confirmed by Heymons, who also gives two as the number in embryonic may-flies. Yet these may be hypercriticisms, and the Text-Book is indispensable to scientific entomologists, forming a welcome complement to Dr. Sharps' "Insects" in the Cambridge Natural History.—P. P. CALVERT.

Bethune, C. J. S. Sketch of James Fletcher, portrait, **75.**—Howard, L. O. On the entomological results of the exploration of the British West India islands by the British Association for the Advancement of Science, **75.**—Knuth, P. How do flowers attract insects? Botanisches Centralblatt 1898, No. 15, Cassel.—Moffat, J. A. Protective resemblances, **75.**—Obituary, Johnson Pettit, **4.**—Poulton, E. B. Theories of mimicry as illustrated by African butterflies; Protective mimicry as evidence for the validity of the theory of natural selection, Report of the British Association for the Advancement of Science, Toronto meeting of 1897, London, '98, and **21.**—Robertson, C. Flowers and insects, xviii. Botanical Gazette, Chicago, April, '98.—Strickland, T. A. G. Further notes on the direct photographic enlargement of entomological specimens, with description of a new apparatus, **8.**

Economic Entomology.—Anon. The pernicious Aspidiotus, Revue Scientifique, Paris, April 23, '98.—Barrows. The present status of the San José scale in Michigan, **75.**—Bethune, C. J. S. Some household insects, figs.; Notes on the season of 1897, figs., **75.**—Britton, W. E. Insect notes of the season, Twenty-first Annual Report, Connecticut Agric. Exper. Station for 1897. Part iv. New Haven, '98.—Chretien, P. Natural history of *Ennychia fascialis* Hb., Naturaliste, Paris, April 15, '98.—Dearness, J. Annual address of the President: The insects of the year, figs., **75.**—Discussion on temperature experiments as affecting received ideas on the hibernation of injurious insects, **75.**—Fletcher, J. The San José scale, figs., **75.**—Harrington, W. H. Notes on the insects of the year 1897, figs., **75.**—Hopkins, A. D. The periodical Cicada in West Virginia, figs., map, 4 pls. Bulletin 50, W. Va. Agric. Exper. Station, Morgantown, W. Va., Jan., '98.—Huard, V. A. The Hemiptera in the Canadian Parliament; The plague of caterpillars on the Saguenay, Naturaliste Canadien, Chicoutimi (Quebec), April, '98.—Hunter, S. J. Notes on injurious insects, **72.**—Kenyon, F. C. Abstract of recent publications, Experiment Station Record ix, 9, Washington, 1898.—Kirkland, A. H. The work against the gypsy moth, 1897, **75.**—Krüger, F. The San José scale question. figs., **74.**—Lintner, J. A. Twelfth Report on the injurious and other insects of the State of New York for the year 1896, 9 text figs., 15 pls., Fiftieth Report on the New York State Museum, Albany, '97. Rec'd May 7, '98.—Lowe, V. H. Inspection of nurseries and treatment of infested nursery stock, Bulletin 136, New York Agricultural Experiment Station, Ge-

neva, N. Y., Dec., '97; Plant lice: descriptions, enemies and treatment, 3 pls., Bulletin 139 of the same.—Marlatt, C. L. Notes on insecticides, **75.**—Matzdorff, C. The San José scale, 1 pl., Zeitschrift für Pflanzenkrankheiten, viii, 1. Stuttgart, April 2, '98.—[Description of a patented insect-catching tree girdle in the same journal.]—Moffat, J. A. The value of systematic entomological observations, **75.**—Nuttall, G. H. F. In explanation of the rôle which piercing insects play in the distribution of infectious diseases, Centralblatt für Bakteriologie, Jena, April 16, '98.—Stedman, J. M. A new orchard pest, the fringed-wing apple-bud moth (*Nothris? maligemmella*), figs.* **4.**

Myriopoda.—Dubosq, O. On the sensory nervous system of Tracheates (Orthoptera, Chilopoda), 1 pl., **73.**

Arachnida.—Pocock, R. I. The nature and habits of Pliny's *Solpuga*, figs., Nature, London, April 28, '98.—Simon, E. On the spiders of the island of St. Vincent, part iii,* **14.**

Orthoptera.—Bordas, L. The salivary glands of Pseudo-neuroptera and Orthoptera (concl.), 3 pls., **73.**—Brancsik, C. Series of new Orthoptera, 3 pls., Jahresheft des naturwissenschaftlichen Vereines des Trencsiner Comitates, Trencsen, '98.—Brindley, H. H. On the regeneration of the legs in the Blattidæ, **14.**—Duboscq, O. See Myriopoda.—Fyles, T. W. The locusts of the Bible, **75.**—Lochard, W. A study of the Gryllidæ (Crickets), figs., **75.**—Lugger, O. Third Annual Report of the Entomologist of the State Experiment Station of the University of Minnesota to the Governor for the year 1897. St. Paul, '98. 297 pp., 187 figs. This is a monograph of the Orthoptera of Minnesota.—Scudder, S. H. The Orthopteran group Scudderiæ,* 1 pl., Proceedings of the American Academy of Arts and Sciences, xxxiii, 15, April, '98.—Walker, E. M. Notes on some Ontario Acridiidæ, **4.**

Neuroptera.—Bordas, L. See Orthoptera.—Currie, R. P. New species of North American Myrmelionidæ, ii,* **4.**—Schenkling-Prévôt. The life of Termites (cont.) Insekten-Börse, xv, 17, etc. Leipsic, April, '98.

Hemiptera.—Bergroth, E. Diagnoses of some new Aradidæ, **8.**—Carpenter, G. H. *Trochopus* and *Rhagovelia*, **8**.—Champion, G. C. Notes on American and other Tingitidæ, with descriptions of two new genera and four species,* 2 pls., **36.**—Cockerell, T. D. A. The Cottonwood snow-scale of Nebraska,* **4**; A Mexican wax-scale in England, **9.**—Gerstaecker, A. On some noteworthy Fulgorinæ of the Greifswald zoological collection, Mittheilungen, naturwissenschaftlichen Verein für Neu-Vorpommern und Rügen in Greifswald, 1896.—Gillette, C. P. American leaf-hoppers of the subfamily Typhlocybinæ,* figs., Proceedings, United States National Museum, xx, No. 1138, Washington, '98.—Handlirsch, A. Monograph of the Phymatidæ,* 6 pls., 35 text-figs., **64.**—Hopkins, A. D. See Economic Entomology.—Kirkaldy, G. W. Notes on aquatic Rhynchota—No. 2, **9.**

Coleoptera.—Georgevitsch, J. The segmental glands of *Ocypus*,

figs., **22.**—Knaus, W. Additions to the list of Kansas Coleoptera, **72.**—Reitter, E. Key to the European species of *Pissodes*, **41.**

Diptera.—Eaton, E. A. Supplement to "A Synopsis of British Psychodidæ," **8.**—Harris, W. H. Note on the teeth of Diptera, figs., 1 pl., Report and Transactions Cardiff Naturalists' Society, xxix, '97.—Hough, G. de N. The Muscidæ collected by Dr. A. Donaldson Smith in Somaliland, Eastern Africa, figs., Proceedings, Academy of Natural Sciences, Philadelphia, '98, pt. i, May.—Johnson, C. W. Diptera collected by Dr. A. Donaldson Smith in Somaliland, Eastern Africa, figs., in the same.—v. Linden, M. On the discovery of *Puliciphora lucifera*, **74.**—Townsend, C. H. T. Diptera from the Mesilla Valley of the Rio Grande in New Mexico, ii, **5.**—Williston, S. W. Notes and descriptions of Mydaidæ,* **72.**

Lepidoptera.—Bacot, A. The British Liparid moths (cont.), **21.**—Bird, H. Notes on the Noctuid genus *Hydroecia*, **4.**—Fyles, T. W. Notes on the season of 1897, figs, **75.**—Gibson, A. A few notes on the season of 1897, fig., **75.**—Godman, F. DuC. and Salvin, O. Descriptions of new species of American Rhopalocera, **36.**—Grant, C. E. Notes on the season of 1897, figs., **75.**—Grote, A. R. The wing and larval characters of the Emperor moths, 4 figs. Proceedings, South London Entomological and Natural History Society, '97.—Howard, L. O. Additional observations on the parasites of *Orgyia leucostigma*, **75.**—Hulst, G. D. Descriptions of new genera and species of the Geometrina of North America,* **4.**—Lyman, H. H. On butterfly books, **75.**—Moffat, J. A. *Catocala illecta* Walk., **4;** Notes on the season of 1897, figs., **75.**—Ottolengui, R. Metallic species of *Basilodes* and new species of allied genera, 1 pl.,* **4.**—Poulton, E B. See General Subject (two papers).—Reuter, E. On a new classification of the Rhopalocera (cont.), **21.**—Scudder, S. H. A study of the caterpillars of North American swallowtail butterflies, i (altered from his Butterflies of the East. U. S. and Can.), 1 pl., **5.**—Stedman, J. M. See Economic Entomology.—Tutt, J. W. Some results of recent experiments in hybridising *Tephrosia bistortata* and *T. crepuscularia*, **36.**

Hymenoptera.—Bignell, G. C. Oak galls, **8.**—Dyar, H. G. Description of an unusual saw-fly larva belonging to the Xyelinæ,* **5.**—v. Ihering, H. The foundation of new colonies and fungus-gardens by *Atta sexdens*, fig., **22.**—Janet, C. On a cavity of the integument of the Myrmicinæ, serving to draw out a product of secretion, figs. Comptes Rendus, l'Academie des Sciences, Paris, April 18, '98.—Konow, F. W. The exotic Cephini, supplementary to my work on the palæarctic Cephini, 1896, **41;** Systematic and critical revision of the saw-fly tribe Lydini, ii, **64.**

Doings of Societies.

A meeting of the American Entomological Society was held April 28th, Dr. P. P. Calvert, vice-president, in the chair. Letters were read, acknowledging election to corresponding membership, from James Fletcher, Ottawa, Canada; A. Handlirsch, Vienna, Austria; F. F. Kohl, Vienna, Austria. A letter from Dr. Henri de Saussure was read in relation to the finding of *Tenodera sinensis* at Philadelphia. Mr. Charles Liebeck reported finding one specimen of *Chlænius purpuricollis*, and also a species of *Bledius* in the yard at his home. Dr. Skinner called attention to the interesting and valuable list of Colorado Lepidoptera recently published by Prof. Gillette in the Bulletin 43 of the Colorado Agricultural Experiment Station. The list is valuable on account of the exact localities and dates of capture being given. Dr. Calvert exhibited some alcoholic specimens of Odonata from Lower California which he had taken to Cambridge, Mass., for comparative study—and these studies showed that in some instances species as listed by authors had been improperly placed as to genera. The differential characters in the wing and leg structures were pointed out in the genera *Dythemis*, *Brechmorhoga*, *Paltothemis* and *Macrothemis*. The same speaker also made some remarks on the character of the new Text Book of Entomology by Dr. Packard. The following persons were elected Corresponding Members of the Society: Prof. August Forel, Zurich, Switzerland; Dr. Gustav Mayr, Vienna, Austria; Sir John Lubbock, Kent, England; Prof. J. H. Comstock, Ithaca, N. Y.

Dr. HENRY SKINNER, *Secretary*.

At the meeting of the Feldman Collecting Social on May 10th a letter was read from Dr. H. G. Griffith dated Phoenix, Ariz., May 1, 1898, in which the collecting experiences of the writer in that region were described. The dryness of the past season and consequental scarcity of certain species were dwelt on, as well as certain social conditions of the region. A list of a number of his captures of Coleoptera was included.

Prof. Smith showed plaster casts of the burrows of insects and spiders. The casts are made by pouring liquid plaster of Paris nto the burrows which is allowed to harden and then carefully

dug out. In *Colletes compacta* the burrows contain but one cell and extend 18 inches into the ground. *Augochlora humeralis* builds a burrow extending in one instance over 60 inches. At various places along the burrow offshoots or branches are put out which contain the cells, which are lined with clay and then stored with food. The present cells are evidently old and contained hibernating bees in many instances.

Mr. H. Wenzel showed specimens of *Pyractomena lucifer*, and spoke of the light emitted by it, which exists in the pupa as well as in the larval state.

The characteristics and food habits of *Pyractomena* were discussed by Messrs. H. Wenzel, Smith and Aaron. The larvæ are carnivorous and probably feed on snails.

Mr. Johnson exhibited specimens of *Xylophaga abdominalis* bred from the larva which were found under the bark of decaying pine at Riverton, N. J. The specimens differ from Texan examples in the extent of red on the abdomen of the female. The larva of *Tabanus atratus* was also shown, the larva and pupa of a *Tipulid*, and a larva of *Stratiomyia*.

Mr. Aaron asked for information regarding the coleopterous larva which bores into chestnut lumber, whose perforations are similar to shot holes.

Prof. Smith referred to a recent paper on the subject by Prof. Hopkins, of the West Virginia Agricultural College, and said the larva was probably *Lymexylon*.

Mr. Aaron also inquired of the members regarding the longevity of insects and mentioned a larva of *Tenebriodes mauritanica* which he has had since October, 1897, and has apparently not grown whatever.

Prof. Smith mentioned the record of a species of *Pissodes* which lived for two seasons and oviposited in two successive years and is still living. The wainscoting of a house in New Brunswick, N. J., has been infested by a beetle larva for at least three years.

Mr. Aaron spoke on the longevity of cerambycid larva and cited Packard as authority for the record of larvæ living for 24 and 40 years. He questioned this record, and stated that there was a likelihood that the larva were more recently introduced into wood than had been supposed.

The same speaker remarked on the stucture of the mud dauber wasp, *Sceliphron cementarius*, after emerging from the pupa.

The abdomen and thorax are connected by thin membranes, probably to brace the immature body of the wasp.

Prof. Smith suggested these membranes are remains of pupal skin.

Mr. Aaron said another pupal skin is present in addition to this membrane.

A vote of thanks was extended to Mr. G. B. King, of Lawrence, Mass., for his donation of microscopic slides.

Mr. H. Wenzel and Mr. Laurent were appointed a Committee on Field Meeting July 4, 1898.

WM. J. FOX, *Secretary*.

Regular meeting of the Newark Entomological Society was held April 10th at Turn Hall at 4 P. M. with Vice-president Brehme in the chair. It was decided to hold the next special meeting at the laboratory of Prof. Smith at New Brunswick. Mr. Rienecker presented a handsome collecting box, in the shape of a book to the Society, to be given to the member who brings the most candidates for membership from Jan. 1, 1898, to Jan. 1, 1899.

Mr. Weidt exhibited a larva of a species of *Sesia* which he is breeding that had bored into the cork stopper of a small bottle in which it was kept since April 9th and is still alive at this writing, April 26th.

Each of the members exhibited a series of the genus *Arctia* which was well represented, particularly in that of Mr. Angelman.

Among the specimens brought by Mr. Erb was a *Plusia formosa* taken in the vicinity of New York city.

Mr. Kircher exhibited a pair of *Hyperchiria io* taken from the pupal cage *in coitu*, which he had mounted and spread as he found them.

Mr. Weidt remarked that he found a pair of *Lagoa crispata* under similar circumstances Nov. 16, 1897; the weather was very cold and the pupæ were kept in the attic.

The next regular meeting will be held at Hemlock Falls, Orange Mountains, May 8th, which will be the first field meeting of the season.

No further business the meeting adjourned.

A. J. WEIDT, *Secretary*.

OBITUARY.

Professor DAVID SIMONS KELLICOTT was born at Hastings Centre, Oswego County, N. Y., January 28, 1842, and died at his home in Columbus, Ohio, April 13, 1898. In his boyhood his frail constitution and delicate health required him to spend much of his time out of doors, and it is to this, no doubt that in part at least, his love for nature may be traced. He graduated from Syracuse University with the degree of B. Sc., while the institution was yet known as Genesee College, teaching one year in southern Ohio, prior to his graduation. After graduating he taught one year in Kingston Normal School, Pennsylvania, after which he was connected for seventeen years with the State University at Buffalo, N. Y., being Dean of the College of Pharmacy, and also Professor of Botany and Microscopy. He came to the Ohio State University in 1888, where, for ten years, he has occupied the chair of Zoology and Entomology. At the time of his death he was General Secretary of the American Association for the Advancement of Science, President of the American Microscopical Society and Treasurer of the Ohio Academy of Science. He had served as President of the Buffalo, N. Y., Academy of Science and of the Ohio Academy of Science.

Animal Parasites of Fishes and the Rotifera, from time to time, claimed considerable of Professor Kellicott's attention, but his entomological work won for him the admiration of the entomologists of America. Patient, conscientious, and utterly devoid of selfishness, he was one of the most kind and lovable men the writer has ever met. Faithful and just with his colleagues and the idol of his pupils, seeking patiently and industriously after the truth, he won esteem while living, and, in his death, he has left numberless friends to mourn his loss. If there was ever a man who deserved the reward—"Well done thou good and faithful servant," that man was David S. Kellicott; and the fruits of his labors on earth will stand as an enduring monument to his faithfulness among his fellow-men.—F. M. WEBSTER.

Especially will the American students of the Odonata feel the loss of Prof. Kellicott. To him is due the recognition of the distinctness of *Enallagma geminata* Kell. from *E. divagans* Selys, the description of *E. fischeri* Kell., and—of greater value—a very considerable number of observations on the habits and conditions of life chiefly of the species recorded in his "Catalogue of the Odonata of Ohio," published in the Journal of the Cincinnati Society of Natural History for 1895, 1896 and 1897.—PHILIP P. CALVERT.

ENTOMOLOGICAL NEWS for May was mailed April 29, 1898.

EXCHANGES

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☞ These notices are continued as long as our limited space will allow; the new ones are added at end of the column, and only when necessary those at the top (being longest in) are discontinued.

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Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2 cent stamp with all insects for return of names. **Please put date of capture and exact locality on each specimen.** Before sending insects for identification, read page 41, Vol. III. Address all packages to ENTOMOLOGICAL NEWS, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera.—For exchange *Argynnis chariclea* var. *artica* Zett. and *Glaucopteryx polata* Hüb. These are from the Peary expedition to North Greenland.—Henry Skinner, M.D., Acad. Nat. Sci., 19th and Race Sts., Phila., Pa.

All Orders.—I have named insects of all orders to exchange for specimens, named or unnamed, of all orders except Lepidoptera.—Charles Brues, 320 Hampden Ct., Chicago.

Wanted to purchase or exchange for specimens of *Pierus rapæ* from all parts of the United States and Canada. Full information of date and locality must be given. Abnormal specimens especially wanted. Address William L. Tower, High School, Akron, Ohio.

Wanted Microlepidoptera, especially *Tineina* from all parts of U. S.; will buy or exchange for Coleoptera and Lepidoptera. Will also collect in other orders if desired. Address Dr. W. G. Dietz, 21 N. Vine St., Hazleton, Pa.

Wanted.—American Dragonflies (Odonata) and Myrmeleonidæ. Sialidæ from any locality. Literature on the above groups.—Chas. C. Adams, Urbana, Ill.

Coleoptera.—Wanted to purchase species of *Nomaretus*, *Cychrus*, *Carabus* and *Calosoma*.—A. Luetgens, 14 W. 17th St. New York City.

Lepidoptera.—*Morpho polyphemus*, *Caligo uranus*, *Antheræa chapala* and other rare Mexican species for exchange. Correspondence solicited. —O. W. Barrett, Clarendon, Vt.

Lepidoptera.—Will exchange anything in my collection, or collect in any branch, for works on any families of Lepidoptera not already in my library.—O. C. Poling, Quincy, Ill.

In the coming season will exchange for exotic Lepidoptera, also native cocoons and pupæ of Lunas: *Cecropia*, *Polyphemus*, *Regalis*, *Imperialis*, *Sm. myops*, *excæcatus*, *A. rubicunda* and many others. Send for list.—George Krautwurm, Arlington Place, Lincoln Ave., E. E. Pittsburg, Pa.

Homoptera.—Wanted Jassidæ and Cercopidæ. Will exchange or purchase.—E. W. Ball, Ft. Collins, Colo.

Lepidoptera of India and Europe for exchange; ova yamamai for sale. *Carabus olympiæ* for sale and exchange. Wanted live cocoons.—Emil Heyer, Moritzstrasse 8, Elberfeld, Germany.

Will name and return species of *Nonagria* and *Hydræcia* for the privilege of retaining desirable species a brief period for purposes of study. —John B. Smith, New Brunswick, N. J.

Lepidoptera.—Cocoons of *P. cecropia*, *T. polyphemus* and *C. promethea* to exchange for Lepidoptera not in my collection.—C. D. Heim, 156 Fourth St., Sunbury, Pa.

Fine Ornithoptera: *Miranda* ♂♀, *Andromache* ♂♀, *Brookiana* ♂♀, *Druryia antimachus*, etc., and Bornean Bflies in exchange (for other exotics). Butterflies only, or buy other rare species.—W. Dannatt, F. E. S., Ivy Dene, Westcombe Park, London S. E. England.

Wanted.—Live pupæ of *Luna*, *Io*, *Imperialis*, *Regalis*, etc., will exchange bird skins, eggs, stuffed birds, etc.—John Clayton, Lincoln, Me.

"Cocoons of *Cecropia*, *Cynthia* and *Promethea* for exchange for some cocoons of *Luna* and *Polyphemus*.—Mathias Mertz, 66 Leonard St., N. Y. City.

I will take in exchange for rare and beautiful exotic butterflies, living pupæ and cocoons of *Pap. ajax*, *zolicaon*, *cresphontes*, *Sm. modestus*, *astylus*, *Eacles regalis*, *imperialis*, *Plat. gloverii*, *A. ceanothi*, *columbia* and others.—Chas. F. Timm, 65 Ralph St, Brooklyn, N. Y.

Lepidoptera.—Exchange wanted from all other parts of the United States and Canada for specimens from northeastern Pennsylvania. Correspondence solicited.—Alfred E. Lister, 921 Vine St., Scranton, Pa.

For exchange.—Insect Life, vol. i, 1–2; vol. iii, 1–6. Price 15c. each.—Eugene R. Fischer, 2707 Winnebago St., St. Louis, Mo.

Geometridæ wanted.—Will purchase or give good exchange in other Lepidoptera. Send lists and prices.—Edw. W. Cross, Manchester, N. H.

Longicorn beetles and Parnassius and Pierids in papers wanted in exchange for about 150 species of Orthoptera and Papilios (my own collection), many rarities included.—John Watson, 94 George St., Alexandra Park, Manchester, England.

Odonata.—I want dragonflies from any locality in America, and will exchange for same. Will collect in any order in this region for cash.—M. J. Elrod, University of Montana, Missoula, Mont.

Lepidoptera.—Living pupæ of *Eacles imperialis* for exchange.—H. Meeske, 321 Wyckoff Ave., Brooklyn, N. Y.

Lepidoptera.—Exchange desired with collectors everywhere. I offer Lepidoptera, and will also collect in other orders. Send lists.—Ernest N. Laing, Essex, Ontario, Canada.

Wanted.—Tingitidæ especially from the U. S. All specimens sent for determination will be returned.—F. M. McElfresh, Urbana, Ill.

Tipulidæ.—Will exchange in any order for North American Tipulidæ.—C. V. Piper, Agricultural College, Pullman, Wash.

Am open to collect any order that is required this season to be found in Colorado. Correspondence solicited.—Ernest J. Oslar, 1853 Marion St., Denver, Col.

Coleoptera.—Perfect specimens of *Alaudes singularis* Horn for exchange. Send lists to Dr. A. Feniges, Pasadena, Cal.

Lepidoptera.—I have a very large number of rare species of American butterflies in duplicate. Liberal exchange given for desiderata.—Dr. Henry Skinner, Acad. Nat. Sci., 1900 Race St., Phila., Pa.

For Exchange.—Sweep net material taken in Louisiana the past season. Contains all orders but Coleoptera. It is well packed in boxes.—G. R. Pilate, 127 S. Commercial St., Dayton, Ohio.

Tettigidæ.—Specimens of this Orthopteran group wanted from any locality.—J. L. Hancock, 3148 Indiana Ave., Chicago, Ill.

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